VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9 (f) AND 1.27(c)) - SMALL BUSINESS CONCERN

I, Roy J. Weaver hereby declare that I am president of Emissions Panther, Inc., a Texas Corporation having an address at P. O. Box 9075, Corpus Christi, Texas 78469 and am empowered to act on behalf of the corporation.

I hereby declare that Emissions Panther, Inc. qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full time, part time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with Emissions Panther, Inc. with regard to the invention, entitled WATER AND FUEL CONDITIONER AND TECHNIQUE FOR ELIMINATING SCALE by inventors Roy J. Weaver and Robert O. Crane described in the application filed herewith.

If the rights held by Emissions Panther, Inc. are not exclusive, each individual, concern or organization having rights to the invention is listed below and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9 (d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

NONE

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Roy J. Weaver

Date 11-20-99

Roy J. Weaver

A

WATER AND FUEL CONDITIONER AND TECHNIQUE FOR ELIMINATING SCALE

This invention involves a water and fuel conditioning technique using a copper based composition to treat water or fuel flowing through a device for the purpose of minimizing scale formation and reducing emissions.

BACKGROUND OF THE INVENTION

It is known in the art to use a copper based composition to treat water to minimize or eliminate scale formation and to treat fuel for one of several advantages. A different mechanism must be operating because some compositions which are effective for fuel treatment are not effective for water treatment, and vice versa.

Copper based compositions in the form of a casting are known to create catalytic changes in water and fuel flowing in contact with the casting. Disclosures of such compositions are found in U.S. Patents 4,715,325; 4,789,031; 4,820,422; 4,959,155; 5,013,450; 5,197,446; 5,204,006; 5,470,462; and 5,814,227.

SUMMARY OF THE INVENTION

In this invention, a composition having 40-60% copper, 2-30% zinc, 10-25% nickel, 2-5% tin, all percentages being by weight, and trace amounts, if any, of iron and lead, produce exaggerated electrical changes in water passing around the composition. Water

flowing around a mass of the composition of this invention produces a higher voltage response than water flowing around a mass of known similar water treating compositions which are conceded to be effective in reducing scale and providing other advantages.

Most of the literature fails to explain why the prior art compositions are effective and, at first exposure, one is skeptical they actually work. As will be shown hereinafter, objective tests show that water flowing in contact with appropriate metal compounds have different electrical properties, depending on the composition of the metal compounds. While not being bound by any theory of operation, it appears the increased electrical charges in water flowing through this invention minimizes the deposition of scale precursors in piping. It appears that typical scale, largely calcium carbonate, does not deposit well on the interior of piping until a precursor, mainly phosphates, is deposited. After the precursor deposits on the interior of piping, calcium carbonate based scale readily deposits. Potable water supplied by municipalities is normally electron deficient and not in optimum states of equilibrium. Colloids in the water are also electron deficient and are drawn, by electrostatic attraction, to metals in the plumbing system and accumulate as scale.

The device of this invention provides a source of electrons. When water is run through a device of this invention, electrons are

provided to reduce or eliminate the electron deficiency. The bonds holding scale to the walls of plumbing components weakens and allows the scale to break up by adding electrons in a catalytic manner. Water treated by this invention thus prevents new scale deposits, tends to remove old scale deposits from plumbing components and provides other advantages.

The same composition is also effective as a fuel conditioner as will be shown hereinafter by tests. In addition to improved effectiveness, a major advantage is the reduction of lead in the composition thereby minimizing or eliminating releasing lead into the fuel and thereby into the environment.

It is an object of this invention to provide an improved water conditioning device comprising copper, zinc, nickel and tin and having only trace amounts, if any, of lead.

A further object of this invention is to provide a method of conditioning water by passing the water in contact with a metal mass comprising copper, zinc, nickel and tin, and having only trace amounts, if any, of lead.

Another object of this invention is to provide an improved fuel conditioning device comprising copper, zinc, nickel and tin and having only trace amounts, if any, of lead.

These and other objects and advantages of this invention will become more apparent as this description proceeds, reference being made to the accompanying drawings and appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a isometric view, partly in section, of a water conditioning installation of this invention;

Figure 2 is a pictorial view of a core of this invention;

Fiagure 3 is a cross-sectional view of the core of Figure 2; and

Figure 4 is a partial cross-sectinal view of a fuel conditioning installation of this invention.

DETAILED DESCRIPTION

Referring to Figures 1-3, a water conditioning installation 10 comprises an inlet fitting 12 connected to a water supply line 14, a valve 16, a chamber 18 receiving a core or casting 20 of the composition of this invention, and an outlet fitting 22 connected to a water outlet line 24. The inlet fitting 12 accordingly provides an inlet port to the chamber 18 and the outlet fitting 22 provides an outlet port from the chamber 18.

The chamber 18 is preferably equipped with an upper union 26 connecting to the outlet fitting 22. A lower union 28 connects the lower end of the chamber 18 to the valve 16. This allows the

chamber 18 to be opened so the casting 20 may be inspected and cleaned if necessary.

The core or casting 20 has an outer surface that is exposed to water passing through the chamber 18. Preferably, the casting 20 promotes turbulent flow in the chamber 18 in any suitable manner. Conveniently, the casting 20 includes a central passage 30 having a series of lateral openings 32 connecting the central passage 26 to the periphery of the casting 20.

It is only the surface of the casting 20 which contacts and thus treats water passing through the chamber 18. Accordingly, the surface of the casting 20 is made of the following composition:

	Percentage	preferred percentage	typical device
copper	40-66%	58-62%	60.01%
zinc	2-30%	20-25%	22.57%
nickel	10-25%	12-16%	15.03%
tin	2-5%	2-3.5%	2.30%
iron	0-1.5%	.005-1%	.05%
lead	0-2%	.005-5%	<.01%

All percentages are by weight. Compositions of this invention have a substantially greater objective effect on water flowing through the device than similar prior art compositions. A typical test is shown in Table I where city tap water was passed through three separate devices. The first device was substantially only copper. The second device was a commercially available product having a composition of about 85% copper, 5-6% zinc, 4-5% nickel and 2-3%

tin, balance impurities, all percentages being by weight. The third device was a composition of this invention, very similar to the "typical device" above. The probe of a dc voltmeter was placed in the outlet stream of the water and the values read off the dial.

Table I

copper only	15-30 millivolts
commercial device	60-90 millivolts
this invention	150-300 millivolts

There are obviously many unknown factors which affect the electrical charge on water flowing through devices of this type as evidenced by the following: (1) the measured voltages are sometimes negative relative to ground and sometimes positive relative to ground and (2) the values measured by the voltmeter vary substantially from one instant to the next. In all cases, however, the measured voltage in water passing in contact with this invention is higher than through prior art devices and the values in Table I are averages.

Although all of the effects of this higher voltage in output water is not completely clear, it is clear that something substantial occurs when water passes through the device of this invention. The most dramatic evidence is seen from the following tests. Water from Austin, Texas was collected before and after passing through a device of this invention. The water was placed in a thin film on

slides, magnified by 200x and then photographed. The before photographs show large calcite crystals. The after photographs show much smaller aragonite flakes. Experience suggests that larger calcite crystals tend to stick together while aragonite flakes do not.

Another substantial advantage of the composition of this invention is a substantial reduction in the amount of lead. Lead is known to be a heavy metal poison having substantial effects on growing children. Serious effects have been made to reduce lead in the environment. The composition of this invention produces higher measurable effects in treated water and does so with only trace amounts of lead.

The composition of this invention is also effective in treating hydrocarbon fuels. A typical installation is shown in Figure 4 where the fuel treatment device 40 includes an inlet fitting 42 providing a flow path 44 through the device 40. The fitting 42 is connected to a fuel supply line (not shown), a chamber 46 receiving a core or casting 48 of the composition of this invention, and an outlet fitting 50 connected to a fuel outlet line (not shown). The inlet fitting 42 accordingly provides an inlet port to the chamber 46 and the outlet fitting 50 provides an outlet port from the chamber 46.

The core or casting 48 has an outer surface that is exposed to water passing through the chamber 46. Preferably, the casting 48 promotes turbulent flow in the chamber 46 in any suitable manner. Conveniently, the casting 48 includes a central passage 54 having a series of lateral openings 56 connecting the central passage 54 to the periphery of the casting 48.

It is only the surface of the casting 48 which contacts and thus treats water passing through the chamber 18. Accordingly, the surface of the casting 48 is made of the following composition:

	Percentage	preferred percentage	typical device
copper	40-66%	58-62%	60.01%
zinc	2-30%	21-26%	22.57%
nickel	10-25%	15-17%	15.03%
tin	2-5%	2-3%	2.30%
iron	0-1.5%	.05-.5%	.05%
lead	0-2%	.01-.5%	<.01%

All percentages being by weight.

The composition of this invention is effective to condition hydrocarbon fuels used in internal combustion engines. This is shown by conventional analysis of exhaust gases of which the values in Table II are exemplary. The before results were obtained by placing a sampling probe in the exhaust pipe from an engine before the installation of a device of this invention for a total sampling period of 240 seconds. The after results were obtained by placing a sampling probe in the exhaust pipe of the same engine after installation of a device of this invention for a total sampling

period of 240 seconds. Cases 1 and 2 involved vehicles. Case 3 was a stationary turbocharged natural gas fueled compressor engine without adjustment of the engine. Case 4 was the engine of case 3 after manually adjusting the engine.

Table II

	Hydrocarbons grams/mile	Carbon Monoxide grams/mile
Case 1 before	2.03	13.10
Case 1 after	1.12	7.00
Case 2 before	1.47	13.20
Case 2 after	.60	5.70

	NOX ppm	Carbon Monoxide ppm	Oxygen ppm
Case 3 before	3500	1800	.20%
Case 3 after	600	1000	6.70%
Case 4 before	1900	5000	.20%
Case 4 after	1250	1050	3.80%

Cases 3 and 4 are on different natural gas fueled Caterpillar G-399TA engines which are turbocharged and aftercooled. The before value was taken as the engine was running before the installation of a device of this invetion. The after value was taken after installation of the device of this invention and adjustment of the engine.

Although this invention has been disclosed and described in its preferred forms with a certain degree of particularity, it is understood that the present disclosure of the preferred forms is

only by way of example and that numerous changes in the details of operation and in the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

I CLAIM:

1. A water conditioner for eliminating scale formation, comprising

a housing having an inlet, an outlet, and a chamber, having a wall, providing fluid communication between the inlet and outlet; and

a core having a surface, the core being received within the chamber, the chamber wall and core surface providing a flow path between the inlet and outlet, the core surface consisting essentially of 40-60% copper, 2-30% zinc, 10-25% nickel, 1-5% tin, 0-1.5% iron and 0-1% lead, all percentages by weight.

2. The water conditioner of claim 1 wherein lead is .005-.5%.

3. The water conditioner of claim 1 wherein lead is less than .01%.

4. The water conditioner of claim 3 wherein iron is .005-1%.

5. The water conditioner of claim 1 wherein lead is zero.

6. The water conditioner of claim 1 wherein copper is 58-62%, zinc is 20-25%, nickel is 12-16%, tin is 2-3.5%, iron is .005-1% and lead is .005-.5%.

7. A method for conditioning an aqueous liquid comprising the steps of providing a hollow chamber having an inlet and an outlet, providing a solid material body in the chamber, passing the aqueous liquid through the chamber and contacting the solid material body and liquid and recovering conditioning liquid from the outlet, the solid material body having a surface exposed to the aqueous liquid consisting essentially of 40-66% copper, 2-30% zinc, 10-25% nickel, 2-5% tin, 0-1.5% iron and 0-1% lead, all percentages being by weight.

8. The method of claim 7 wherein lead is 0-.5%.

9. The method of claim 7 wherein lead is 0-.1%.

10. The method of claim 9 wherein iron is 0-.5%.

11. The method of claim 7 wherein lead is zero.

12. The method of claim 7 wherein copper is 58-62%, zinc is 21-26%, nickel is 15-17%, tin is 2-3%, iron is .05-.5% and lead is .01-.5%.

13. A method for conditioning a liquid hydrocarbon fuel comprising the steps of providing a hollow chamber having an inlet and an

outlet, providing a solid material body in the chamber, passing the liquid hydrocarbon fuel through the chamber and contacting the solid material body and liquid and recovering conditioning liquid from the outlet, the solid material body having a surface consisting essentially of 40-66% copper, 2-30% zinc, 10-25% nickel, 2-5% tin, 0-1.5% iron and 0-2% lead, all percentages being by weight.

14. The method of claim 13 wherein lead is .01-.5%.

15. The method of claim 13 wherein lead is less than .01%.

16. The method of claim 13 wherein iron is .05-.5%.

17. The method of claim 13 wherein lead is zero.

18. The method of claim 13 wherein copper is 58-62%, zinc is 21-26%, nickel is 14-17%, tin is 2-3%, iron is .05-.5% and lead is .01-.5%.

Abstract of the Disclosure

A water and fuel conditioning device includes a core or casting made of 40-66% copper, 2-30% zinc, 10-25% nickel, 2-5% tin, 0-1.5% iron and 0-2% lead, all percentages being by weight. Water flowing in contact with this core exhibits greater electrical charge than with prior art devices. The same composition is effective as a fuel conditioner to reduce emissions. In both applications, the near absence of lead has environmental advantages.

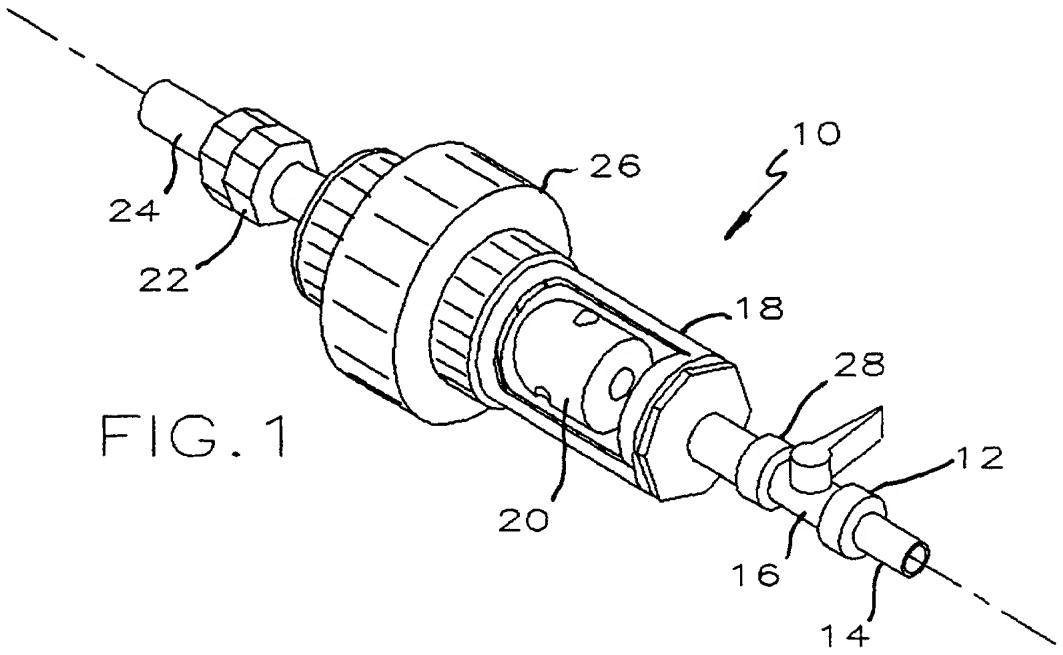


FIG. 1

FIG. 2

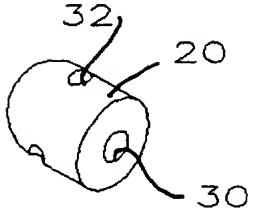
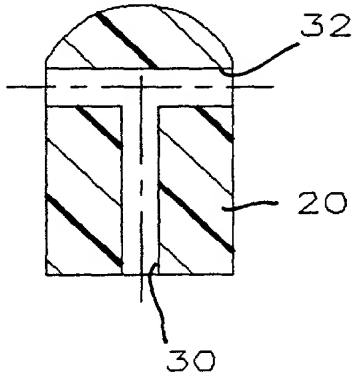


FIG. 3



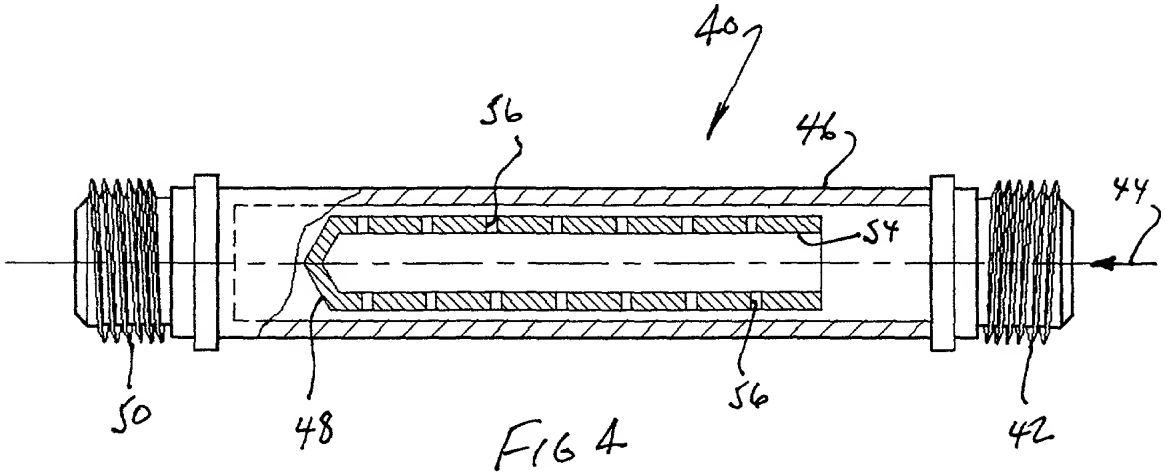


FIG 4

DECLARATION FOR PATENT APPLICATION

We, Roy J. Weaver and Robert O. Crane hereby declare:

We reside in the places set forth below, have post office addresses as set forth below and are citizens of the United States of America.

We believe we are the original, first and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled WATER AND FUEL CONDITIONER AND TECHNIQUE FOR ELIMINATING SCALE, the specification of which is attached hereto.

We hereby state that we have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment filed heretofore.

We acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, CFR section 1.56(a).

We hereby claim foreign priority benefits under Title 35, United States Code, section 119 of any foreign application for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed: NONE.

We hereby appoint G. Turner Moller, Registration 22,978, our attorney to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith. Make all telephone calls to G. Turner Moller at 512/883-7257. Address all correspondence to G. Turner Moller, 720 American Bank Plaza, Corpus Christi, Texas 78475.

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Roy J. Weaver Date 11-20-99

Roy J. Weaver, a resident of Nueces County, Texas
P. O. Box 4322, Corpus Christi, Texas 78469

Robert O Crane Date 11-22-99

Robert O. Crane, a resident of Nueces County, Texas
P. O. Box 4322, Corpus Christi, Texas 78469

VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS
37 CFR 1.9(f) AND 1.27(b) - INDEPENDENT INVENTOR

We, Roy J. Weaver and Robert O. Crane, hereby declare that we qualify as independent inventors as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41.(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled WATER AND FUEL CONDITIONER AND TECHNIQUE FOR ELIMINATING SCALE described in the specification filed herewith. We have not assigned, granted, conveyed or licensed and are under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9 (d) or a nonprofit organization under 37 CFR 1.9 (e).

We have not assigned, granted, conveyed or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention, except that an implied license to use the invention has been granted to Emissions Panther, Inc.

We acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28 (b))

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Roy J. Weaver

Roy J. Weaver

Robert O Crane

Robert O. Crane

Date: 11-22-99

United States Patent & Trademark Office

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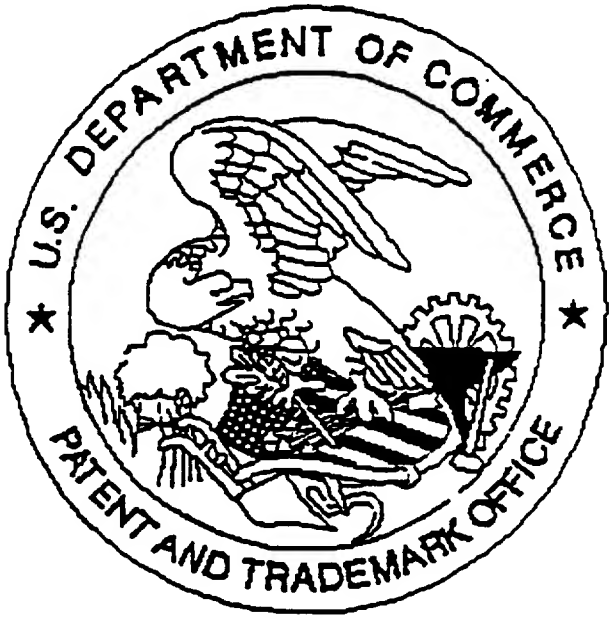

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